15¢
$5.50 A YEAR

May 29, 1954

VOL. 65 NO. 22 PAGES 337-352

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Science Fair Winners
See Page 342

A SCIENCE SERVICE PUBLICATION

PSYCHOLOGY

Desegregation Opposition

When the time arrives to put into effect the Supreme Court's ban on racial segregation in public schools, the loudly voiced opposition will die out.

▶ THE BITTER and loudly voiced opposition to desegregation in schools on the basis of the Supreme Court's decision that racial segregation is unconstitutional will probably come to an end when the time arrives to put the desegregation into effect.

The protests are likely to continue all summer and increase in violence as autumn approaches. However, when the time comes to admit Negro pupils to the school of their choice without regard to color, there will be little or no violence, and the new situation will be accepted quietly and the opposition will die out.

This prediction is based on a survey of what has happened where desegregation has already been effected.

Active resistance to the change, or violent action, is no more likely in communities where individuals are strongly prejudiced, a study made by Cornell University of 20 American communities showed. Even strongly prejudiced persons will accept and adapt themselves to the changed situation, once the change is in effect.

Desegregation has already been put into effect in elementary and secondary public schools within the past five to ten years in local communities of 12 states, including some as far to the south as Arizona, Maryland and New Mexico.

In general, the change over has been made without violence or incident. This is shown by a survey reported in the *Journal of Social Issues* (Vol. 9, No. 4), a special issue edited by Dr. Kenneth B. Clark, associate professor of psychology at the College of the City of New York.

Desegregation of Catholic parochial schools in two cities, Washington, D. C., and St. Louis, Mo., demonstrate two methods of putting the change into effect. In Washington, a slow, gradual persuasive method was adopted. The Archbishop, Rev. Patrick A. O'Boyle, issued no direct order. Instead, he merely talked to his clergy and school officials individually, and every effort was made to avoid antagonizing the opponents of desegregation.

As a result, the pace of the change varied from school to school. Now, five years later there are still all-Negro and some all-white parochial schools in Washington.

In St. Louis, the desegregation was accomplished by a direct order from Archbishop Ritter. He refused to be swayed by open opposition of 700 Catholic parents and quieted them by threat of excommunication. Now there are no all-Negro parochial schools in St. Louis. A few parents withdrew their children from school and sent them elsewhere, but six months after the order was issued officials had received not one report of friction among white and Negro pupils.

The accomplishment of efficient desegregation with a minimum of social disturbance depends upon five factors, the scientists found:

1. A clear statement of policy by leaders with prestige and other authorities.
2. Firm enforcement of the changed policy and persistence in the face of any initial resistance.
3. Willingness to deal with violation or any attempt at violation with strong enforcement action.
4. Refusal to tolerate subterfuges.
5. An appeal to the individuals concerned in terms of their religious principles of brotherhood and their acceptance of the U. S. traditions of fair play and justice.

The Supreme Court decision may serve to strengthen the moral backbone of many individuals whose consciences are now at war with their racial prejudices, and so bring them welcome relief from internal conflict, in the opinion of psychologist Dr. Gordon Allport of Harvard University.

"People really know that segregation is un-American, even the masses in the South know it. They also have prejudices. This mental conflict is acute. . . . People do accept legislation that fortifies their inner conscience. Protests are short-lived and readjustment rapidly sets in," he said.

Science News Letter, May 29, 1954

PSYCHOLOGY

Segregation Decision Undercuts Propaganda

▶ TO THE extent that the Supreme Court decision that racial segregation in public schools is unconstitutional results in the wiping out of racial discrimination in this country, we will take away from the Communists one of their most effective arguments against the American way of life.

Making all the public schools equally available to all children without regard to race or color would increase our prestige immeasurably in foreign countries, especially in countries, such as India, where the people have dark skins. These countries are now being made particular targets of Communist propaganda.

This probable foreign reaction to the Supreme Court's decision is suggested by statements by Dr. Otto Klineberg, prominent social psychologist of Columbia University, in "Social Psychology." (See p. 348.)

The court's decision will be welcomed by psychologists as an application of the findings of psychological science with regard to the lack of scientific proof of inborn psychological differences between the races.

Psychologists are practically unanimously opposed to any political action based on racialism, Dr. Klineberg says. Several psychological bodies have issued statements, as have professional organizations in the field of anthropology and genetics, to the effect that there is no proof of inborn psychological differences between ethnic groups and, therefore, no scientific basis for racial discrimination.

Even the few psychologists who do hold that such inborn differences between races or peoples do exist would agree that the overlapping of abilities between groups is so great that there is no scientific justification in considering all members of one race superior and all those of another inferior.

"Acceptance of this 'fact,' and action based upon it, would produce a revolution in human relations which would transform some of the most important aspects of international politics," Dr. Klineberg declares.

Science News Letter, May 29, 1954

RADIO ASTRONOMY

Report New Kind Of Heavenly Object

▶ DISCOVERY OF a striking new kind of heavenly object, only nine of which have so far been spotted, has been reported by three radio astronomers from the University of Manchester, England.

The objects are very intense radio "stars," three of which have been identified with long wispy streaks that scientists call nebulosities. The other six are probably associated with such nebulosities also, but their light is so faint it has not yet been caught on photographic plates.

These nine "represent a definite class of object" in our Milky Way galaxy, Drs. R. Hanbury Brown, H. P. Palmer and A. R. Thompson suggest in *Nature* (May 15). Their observations were made at the Jodrell Bank Experimental Station of the University.

Sensitive radio telescopes pick up radio waves from radio "stars." So far only five radio sources have been definitely identified with visual stars. Of these five, three are of the newly discovered type just reported. The other two radio "stars" are quite different in kind from the three that are associated with the nebulosity.

The visual identity of one of these three was reported for the first time. It is associated with a faint nebulosity in Auriga, the charioteer, a constellation visible low in the northwest sky, Dr. R. Minkowski of Mount Wilson and Palomar Observatories has found.

The nine intense radio sources all seem to have rather low temperatures, of the order of a few hundred degrees, rather than thousands or millions of degrees as most visual stars do, and as do the other two radio "stars" that have been identified with visual objects.

Science News Letter, May 29, 1954

PHYSICS

Relativity Fails Two Tests

Interpretation of old eclipse photographs and the Einstein gravitational red shift are being questioned as the result of new observations and calculations.

➤ TWO OF the critical verifications of the Einstein general theory of relativity are being called in question by new observations and calculations reported to the American scientists by Dr. Dirk ter Haar, theoretical physicist of St. Andrews University, Scotland, now visiting professor at Purdue University, Lafayette, Ind.

There is no upsetting revision of Einstein's great formulations as to the nature of the laws of the universe which have virtually revolutionized our way of viewing things. And the famous Einstein equivalence of mass and energy, basic to the atomic bomb, is not involved at all.

One of Prof. Albert Einstein's colleagues in the 1920's when they were at Berlin's Potsdam Observatory in Germany is Dr. Edwin Finlay-Freundlich, now at St. Andrews University Observatory.

He has been reinvestigating the experimental tests for the validity of Einstein's general relativity. Less than a year ago, he began to report divergences from what can be read in most textbooks; that is, that the three possible tests show agreement between predicted and observed effects.

The first test, the movement of the perihelion of the planet Mercury, is not questioned.

When it comes to the deflection of light by the sun, tested at total eclipses of the sun, the situation is different. The reported agreement at the eclipse of 1919 brought Einstein to world attention.

Eclipse photographs of 1922, 1929 and 1936 re-interpreted by Dr. Freundlich show that the deflection of star light toward the sun by its gravitational effect is 30% higher than predicted. Dr. Freundlich will make observations at the total eclipse of the sun on June 30 from Sweden that should tell definitely whether this disagreement is real.

The so-called Einstein gravitational red shift is also in trouble. Light coming from a heavy body with a strong gravitational field will be shifted toward the red end of the spectrum. The Einstein theory predicted the amount of the shift.

For the prodigiously heavy white dwarf stars, like the famous companion of Sirius, it turns out that this red shift is about a sixth that predicted from Einstein's formula. On the other hand, for extremely hot stars the red shift turns out to be much larger, ten or more times the one predicted.

Dr. Freundlich has worked out a new formula which gives the kind of red shifts that are actually observed. This new mathematical idea is used on the reddening of star light that astronomers believe may be due to a great expansion of the universe and a great blowing apart of the hundreds of thousands of galaxies of stars.

It works out, Dr. ter Haar reported, if it is assumed that astronomical space between the galaxies is very, very cold, a mere 1.5 degrees above absolute zero of temperature, as it is believed to be.

It looks as though the general theory of relativity is all right as long as it is dealing with purely gravitational effects as in the planet Mercury tests, but breaks down as soon as electromagnetic radiation effects come into play.

If particles of light, the photons, are assumed to act like material particles they will fall toward heavy bodies, like the sun. The job now, Dr. ter Haar explains, is to work out the proper theory that gives the correct values.

Dr. ter Haar, who was born in Holland and educated at Leyden, is about to return to his Scottish university post. On his way back he hopes to visit Einstein at Princeton, N. J., to discuss the new formulations of the Einstein theory.

Science News Letter, May 29, 1954

• RADIO

Saturday, June 5, 1954, 3:15-3:30 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS Station.

Dr. Selman A. Waksman, professor of microbiology and director of the Institute of Microbiology, Rutgers University, will discuss "Microbiology — Past and Future."

PHYSICS

High Neutron Source Available to Public

➤ A UNIQUE research tool, a high intensity neutron source, is now available to the public at the Atomic Energy Commission's Materials Testing Reactor, Idaho, the AEC has announced.

This reactor can produce isotopes of higher specific radioactivity than the Argonne, Brookhaven or Oak Ridge reactors, where irradiation services are also available to the public.

Portions of the area of the reactor's greatest neutron intensity, used primarily for AEC projects, may also be provided from time to time. The AEC's program will have first choice, however, and security will not be endangered since the actual experiments at the reactor will be done by cleared personnel.

Primary purpose of the MTR is to test materials for use in other reactors.

Science News Letter, May 29, 1954

REACTOR TANK CANAL—Radioactive fuel of enriched uranium 235 for the Atomic Energy Commission's Materials Testing Reactor, Idaho, and other pieces for the pile, are lifted with grappling tools and lowered through a chute and valve mechanism in the bottom of the reactor tank into this canal, which holds 18 feet of water. The pile's high intensity neutron beam has just been made available to the public.

PSYCHIATRY

Expert Witness Panel

▶ WIPING OUT the legal system of calling doctors as expert witnesses to testify for or against a man being tried for a crime is urged by psychiatrist Dr. Gregory Zilboorg in "The Psychology of the Criminal Act and Punishment." (See SNL, May 22, p. 332.)

Under the present expert witness plan, Dr. Zilboorg says, psychiatrists are being used as "baseball bats" to flay the opposing counsel in a fight-to-the-finish attempt to defeat the other side.

In the heat of the battle, the defendant himself and the condition of his mind are all but forgotten. The psychiatrist, under grilling cross-examination, is subjected to the worst kind of humiliation, especially if the trial happens to attract public attention and arouse public opinion.

Instead of witnesses for either side, Dr. Zilboorg proposes that the American Psychiatric Association should formulate its own moral code and should establish definite scientific medical standards that the doctor must attain in order to be qualified as a psychiatric expert for the court. The Association would then maintain a list of its members so qualified and would furnish it to the courts.

For any particular trial, a panel would be made up of three psychiatrists from this list to advise the court. Lawyers for both sides would be permitted to take part in the selection of the panel, just as they do in making up a jury, by challenging any particular psychiatrist until three experts were chosen, sworn in and put to work.

The psychiatric expert would be required by the Psychiatric Association to confine his testimony to his medical knowledge and would be forbidden to give his opinion on the legal "insanity" or "responsibility" of the accused.

These are purely moral or legal questions and are not within the professional knowledge of the expert, Dr. Zilboorg says.

Part of the friction between lawyers and doctors is due to the very different emphasis of their whole training, he points out. The lawyer learns to seek exact definitions and insists on getting them from his expert witness. The doctor learns to qualify everything he says. The lawyer wants to fit everything into neat categories. The doctor learns that each living person is distinct and different from every other and that the same rules do not apply to all men. The lawyer, and the judge, focus their attention on the criminal act, and they are trained to see the law as intended to punish or revenge such acts. The doctor looks, not at the act, but at the person who commits it.

"I sometimes think how wonderful the effect on legal education would be to have more human contact between the future lawyer and those with whom he will have to deal later," Dr. Zilboorg said.

"What would happen, for instance, if young law students included in their studies visits to jails and prisons, and served as prison guards for a while, the way medical students serve as clerks in hospitals during their student days; if the young law student were required to attend so many executions, as medical students are required to attend and report on so many autopsies; if the law student got some authentic case histories from various prisoners and compared them with their court and probation-officer records, in the same manner as medical students and interns are required to take case histories and examine patients and then compare the data thus obtained with the hospital records?"

Science News Letter, May 29, 1954

MEDICINE

Double Drug for TB

▶ AN ANTI-TUBERCULOSIS vaccine from powdered dead germs and a double drug combination for eradicating the germs from the body were announced at the meeting of the National Tuberculosis Association in Atlantic City.

Eradicating TB germs, so they no longer exist in the body instead of just being stopped from growing and multiplying, is something new. It has been accomplished in animals by combining the drug, isoniazid, now used with pyrazinamide.

However, there have been signs of liver damage from the combination, so the study is being continued to determine whether it will be safe to give the two drugs to humans.

This study, which is under the direction of Dr. Walsh McDermott of Cornell University Medical College, New York, is being aided by a grant from the National Tuberculosis Association.

The dead germ powder vaccine was made by Drs. David W. Weiss and Rene J. Dubos of the Rockefeller Institute for Medical Research, New York. They made it by killing tuberculosis germs with carbolic acid, dehydrating them and then grinding them into a powder.

Tested on mice, the vaccine was found to give as good protection against tuberculosis as BCG vaccine, but the immunity from the powdered dead germ vaccine did not last as long.

BCG, or Bacillus of Calmette and Guerin, a bovine strain of tubercle bacillus which has lost its virulence, is the best known of the preparations used to produce artificial immunity to tuberculosis, but it is not considered a perfect vaccine.

Dr. Weiss said that the powder vaccine was effective whether it was made from virulent or non-virulent strains of the germ. This shows that the protective effect is not related to factors usually associated with virulence, such as the growth pattern of the bacilli, and that an extract from the germ, as well as the whole germ, can elicit the protection immediately.

The scientists pointed out that the acquired resistance produced by the powder vaccine could not completely prevent the development of disease from a second invasion of virulent organisms, but "only retarded its course." The vaccine, still experimental, has not been tried on humans.

Science News Letter, May 29, 1954

SCIENCE NEWS LETTER

VOL. 65 MAY 29, 1954 NO. 22

The Weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1954, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ELdorado 5-5666, and 435 N. Michigan Ave., Chicago 11, SUperior 7-6048.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Representatives of the American Association for the Advancement of Science: Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University; Paul B. Sears, Yale University. Representatives of the National Academy of Sciences: Homer W. Smith, New York University; Edward U. Condon, Corning Glass Works; Harlow Shapley, Harvard College Observatory. Representatives of the National Research Council: Duane Roller, American Association for the Advancement of Science: Ross G. Harrison, Yale University; Leonard Carmichael, Smithsonian Institution. Representatives of the Journalistic Profession: Neil H. Swanson, Baltimore, Md.; O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal. Representatives of the Scripps Estate: Charles E. Scripps, Cincinnati, Ohio; Edward J. Meeman, Memphis Press-Scimitar; John T. O'Rourke, Washington Daily News.

Officers — President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Allen Long. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. Interlingua Division in New York: Alexander Gode, Hugh E. Blair, 80 E. 11th St., GRamercy 3-5410.

BIOCHEMISTRY

Radioactive Morphine Gives Addiction Clue

▶ THE FIRST human studies with radioactive morphine have given University of California scientists a clue that may have some significance in addiction to the drug.

They found that the only addict studied eliminated the drug faster than normal people. This suggests, they said, the need for further studies to find out if addicts characteristically handle morphine faster.

The scientists also found that the drug is broken up in the body and eliminated more rapidly by normal people than had been suspected.

Morphine with built-in radioactive carbon was used. Each dose contained less radioactivity than everyone receives daily from cosmic radiation, but enough to follow through the body with sensitive counter devices. The doses given were therapeutic does, about as much as a doctor gives in normal practice to relieve pain.

Soon after administration, part of the radioactivity began to appear in the breath, reaching a peak in one hour and declining to a low level after six hours. Six hours is about the time the physiological effect of the dose wears off.

Elimination of the radioactivity-containing segment of the morphine molecule indicated that the body starts breaking up the drug molecules soon after intake. Most of it is eliminated within 24 hours.

The object of the study is to learn just where and how morphine acts in the body. With better knowledge, the scientists hope to develop drugs that will do the same job as morphine without causing addiction.

The research was done in the School of Medicine, San Francisco, and the Radiation Laboratory, Berkeley, by Drs. H. W. Elliott, T. K. Adler, H. H. Anderson, B. M. Tolbert and Henry Rappoport.

Science News Letter, May 29, 1954

GEOLOGY

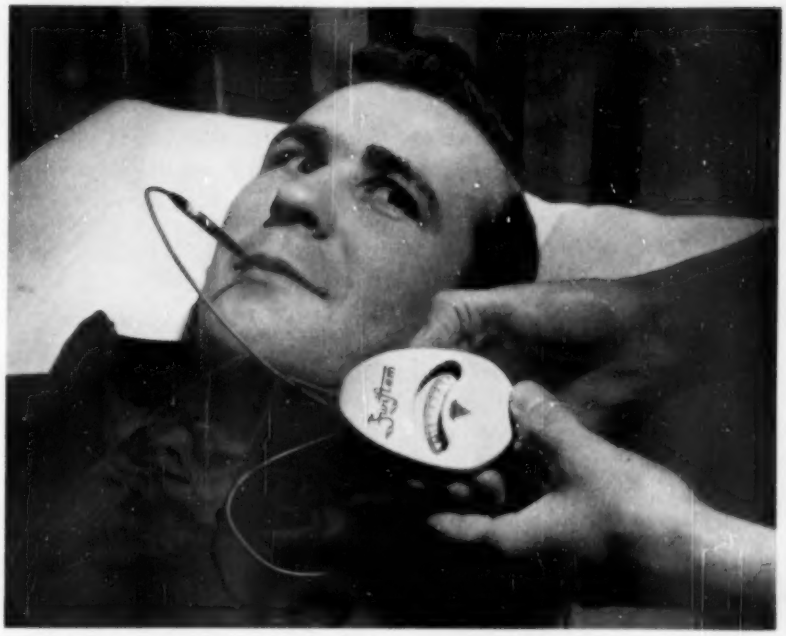
Use Helicopters To Map Greenland

▶ USING HELICOPTERS to get an accurate geologic map of northwest Greenland saved about four-fifths of the cost of mapping by walking over the area, Dr. William E. Davies of the U. S. Geological Survey reports in *Science* (May 14).

Thirty to 60 square miles per day can be survey by helicopter, field work in Greenland during the summer of 1953 showed. And the "whirly-birds" can operate when ground fog is so thick that a landbound geologist would be lost.

To complete a geologic map of the region near Thule, the desired areas were surveyed from 1,500 feet or so. For more detail, the helicopters then flew at altitudes of 10 to 200 feet and speeds of 10 to 40 miles an hour. Landings to get samples were made whenever necessary.

Science News Letter, May 29, 1954



ELECTRONIC TEMPERATURE TAKING—Sgt. Thomas L. Early, Rimersburg, Pa., a patient at Walter Reed Army Hospital, having his temperature taken with new electronic clinical thermometer.

MEDICINE

Take Temperature Fast

▶ FUTURE HOSPITAL patients may not have to strain their lips to keep them tightly closed over a slippery glass tube for three to five minutes while their temperatures are taken.

Nurses will be relieved of the arm-tiring job of shaking down the mercury column. There will be no more squinting to read the elusive column of figures that tell the degree of temperature. Thermometer breakage, a costly item in hospitals, will also be a thing of the past.

All this for the not too distant future in hospitals and homes because an Army dentist, Col. George T. Perkins, now stationed at Walter Reed Army Medical Center, Washington, has invented a new electronic thermometer.

The new thermometer gives an accurate reading in five to seven seconds.

It works through a tiny carboloy thermistor at the end of a stainless steel probe, or sensing advice. This is the part that goes in the patient's mouth. The probe is connected by a flexible transmission cord to a mercury cell battery in a plastic handpiece small enough to fit in the palm of the hand.

On the handpiece is a meter that registers degrees of temperature in black figures below the body's "normal" of 98.6 degrees Fahrenheit and in red above this normal. The thermistor resists heat and translates this resistance in terms of degrees on the meter.

Tests in one Army hospital showed the new thermometer takes daily ward temperatures in a fortieth the time normally needed.

The new thermometer, first change in clinical thermometers since the mercury column type was introduced in 1867, is being manufactured by the Burlington Instrument Company, Burlington, Iowa. The company expects to have the thermometer on the market in 60 to 90 days. The first ones, for hospital use, will cost about $75. A home model, now being worked on, will be scaled down to cost considerably less, perhaps $25.

Because of the small size of the sensing device, or probe, scientists will for the first time have an accurate thermometer for taking temperatures of small animals.

Science News Letter, May 29, 1954

INVENTION

Patent Chemical to Waterproof Leather

▶ WATERPROOF LEATHER shoes soon may outmode rubber overshoes. A way has been found to waterproof leather with a siloxane—a chemical famous for its water-repellent nature. The chemical can be swabbed on the leather. It will not clog the pores. Toivo A. Kauppi of Midland, Mich., assigned patent No. 2,678,893 to Dow Corning Corporation.

Science News Letter, May 29, 1954

GENERAL SCIENCE

Winning Science Projects

Eighteen winners are awarded their "wish-list" prizes at the Fifth National Science Fair held at Purdue University. The judges were amazed at the excellence of exhibits.

See Front Cover

► STAR-SPANGLED PHOTOGRAPHS of the night sky taken through a home-built telescope, a new way of printing patterns on hard-to-dye Dacron, a Stark modulated microwave spectrograph, the way plants are made to propagate, and the way light affects plant growth captured top national honors at the Fifth National Science Fair for three boys and two girls from Iowa, Missouri, Tennessee, Virginia and the District of Columbia.

Made by teen-aged scientists, the excellence of the exhibits amazed the judges, Watson Davis, director of SCIENCE SERVICE, said. A total of 18 awards was granted this year instead of the regulation 12. The winners are shown on the cover of this week's SCIENCE NEWS LETTER.

First place awards, consisting of $125 in scientific equipment desired by the winner, went to the top boys and girls in each of the two exhibit classifications, physical sciences and biological sciences.

Doris Jean Hermes, 18, Martinsville (Va.) High School took top honors for her method of discharge printing on Dacron. She was also a first place winner in 1952 and 1953.

Philip Robert Lichtman, 17, Woodrow Wilson High School, Washington, D. C., and Samuel Theodore Scott Jr., 16, West End High School, Nashville, Tenn., tied for first place in the physical group for the boys. Their exhibits, respectively, were "Hydrogen-Alpha Photography of Emission Nebulae," a photographic exhibit of the heavens taken through his home-built telescope, and "Stark Modulated Microwave Spectrograph."

First place award to a girl in the biological sciences went to 18-year-old Leigh Ferne Temme, Lutheran High School, St. Louis, Mo. Her exhibit shows the different methods by which plants are propagated by nature and man. She has been working on this project since 1950.

The first place award for the best biological exhibit shown by a boy went to James D. Gohman, 16, Teachers College High School, Cedar Falls, Iowa. He dramatized light's effect on plant growth.

The second place awards, each $75 in scientific equipment and books of their own choosing, were taken by:

Patricia Ruth Ludeman, 18, Chattanooga (Tenn.) High School, for a home-made working model of a subsonic wind tunnel.

Sarah Patricia Bellamy, 16, Bakersfield (Calif.) High School, for a set of dancing balls that shows how waves are propagated.

Three boys won second place awards in the physical science competition. They are Martial Leon Thiebaux Jr., 17, Whittier (Calif.) High School, for his exhibit on amateur astronomical photography; Donald Louis Crabtree Jr., 18, Richmond (Ind.) Senior High School, for his display on heavy water of crystallization; and David Charles Waters, 17, Trenton (N. J.) Central High School, for his cartridge that plays phonograph records, using a photoelectric principle.

Girls winning second place honors in the biological category were 16-year-old Patricia Ann Pascus, Farmington High Schootl at Unionville, Conn., for her display on enzymes, the body chemicals that are the "key to life"; and Carolyn Sue Evans, 18, Martinsville (Va.) High School. She designed a "scientific" pillow, using X-rays to help her prove that the spine should be rested in a normal position for the greatest sleeping comfort.

The only second place award to a boy in the biological category was claimed by Richard LeRoy Ware, 18, Richmond (Ind.) High School. He did a photomicrographic study of moth and butterfly wing scales.

Third place awards of $50 in "wish-list" equipment went to:

Sidney E. Lyons Jr., 16, Chattanooga (Tenn.) High School, for his model showing the restoration and archaeology of Hiwassee Island.

David Irvin Gilbert, 17, George Washington High School, San Francisco, Calif., whose exhibit showed how plants "breathe" out water.

Charles William Waldron, 18, Midland (Mich.) Senior High School, for his display of skeletal staining and study of bone structure. Rebecca Jane Hutto, 17, Tipton (Ind.) High School, for her exhibit on Indiana insects.

Alice Louise Shaffer, 17, Union-Endicott High School, Endicott, N. Y., for her studies of the reaction that thyroxin has upon chick embryos.

A board of 15 judges critically rated the 95 exhibits for several hours before turning in their decisions. The awards were announced at an awards luncheon by Dr. George A. Hawkins, chairman of the judges and dean of the schools of engineering at Purdue.

The National Science Fair is sponsored by Science Clubs of America, administered by SCIENCE SERVICE. It is co-sponsored by local newspapers, universities, professional, technical and civic societies who help send each finalist to the national fair on all-expenses-paid trips.

SCIENCE FAIR EXHIBITS—Left to right, Dr. Karl Lark-Horovitz, head of Purdue University's physics department, congratulates the five first place winners; Marjorie Ann Johnson, 17, Central High School, Grafton, N. D., checks over her notes on Color Vision; Henry H. Eichelberger, 18, Christchurch (Va.) School, is shown with his chigger trap, the small object on far right; Robert Dixon Dycus, 17, Lewis and Clark High School, Spokane, Wash., illustrates the solar system as it was on May 15, 1954; Leigh Ferne Temme points to the tumbleweed in her collection of plants; Jere DeLee Dando, 18, Shawnee-Mission High School, Merriam, Kans., shows the cloud chamber he built; Patricia Ruth Ludeman makes a final adjustment on her subsonic wind-tunnel; Karen Lauretta Dobson, 15, Mesa (Ariz.) High School, shows how colored lights affect plant growth; Beatrice Marie Wood, 17, St. Joseph Academy, Cleveland, Ohio, displays her work with chromatography; Philip Robert Lichtman shows his home-built telescope; Doris Jean Hermes checks a swatch of Dacron she printed, and Michael B. Lien, 17, Central High School, Fargo, N. D., displays crystals he grew and then photographed under a microscope.

MEDICINE

Lung Cancer to Be 18% Of All Cancers in 1970

► IF THE number of smokers in the country continues to be the same as at present, in 1970 one out of every five persons with cancer will have lung cancer.

This prediction was made by Dr. Alton Ochsner of New Orleans at the meeting of the National Tuberculosis Association in Atlantic City, N. Y.

Fortunately, this cancer is curable, Dr. Ochsner declared. The curative treatment is removal of the affected lung. The cure rate today, however, is not as high as it should be, he declared.

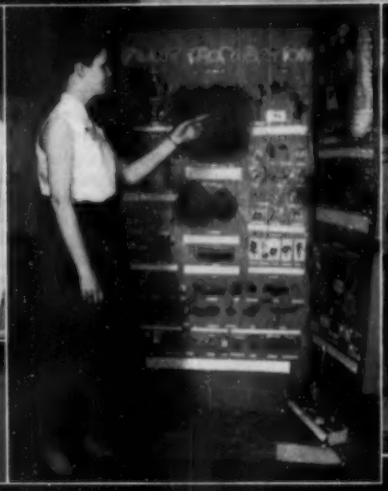
Every man past 40 who has unexplained chest discomfort, particularly if he has been a heavy smoker, should be suspected of having lung cancer until proved otherwise, Dr. Ochsner warned.

Too many persons with cancer of the lung are being treated for virus pneumonia, he declared.

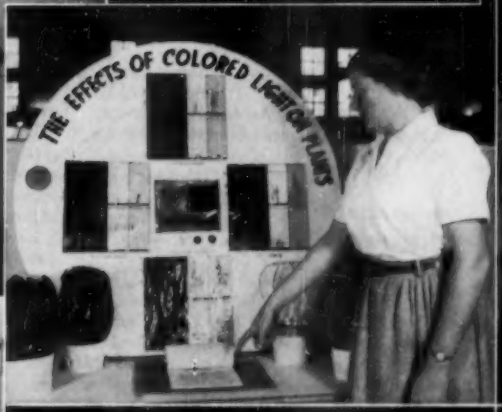
In more than 1,200 cases of lung cancer seen by Dr. Ochsner and his associates, there was an average delay of eight months from the first symptom to the time definitive treatment for the lung cancer was started. Part of the delay was the fault of the physician and part the fault of the patient.

THE LIFE HISTORY
OF A CRUSSER

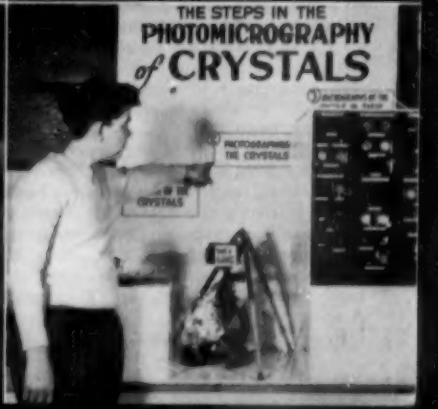
THE SOLAR SYSTEM MAY 15 1954 A.D.
SHOWING:



A CONTINUOUS
CLOUD-CHAMBER


THE EFFECTS OF COLORED LIGHT ON PLANTS

THE EXTRACTION
OF CHLOROPHYLL
CHROMOTOGRAPH


THE STEPS IN THE
PHOTOMICROGRAPHY
of CRYSTALS

GENETICS

Lysenko's Claims Are "All Greek"

▶ THE CLAIMS of Lysenko, Russian geneticist reportedly falling into disfavor in the USSR, "are really all Greek to us," Dr. L. P. Coonen of the University of Detroit has concluded after a bit of historical research.

The great thinkers of Athens in 350 B.C. were testing the very ideas now called Lysenko's. Lysenko insists he can "shatter" the heredity of a plant by placing it in a radically changed environment, thus changing wheat into barley.

Dr. Coonen has found that both Aristotle and Theophrastus suggested this about 2,300 years ago. Lysenko's other claims, as of pretreating seeds to alter their kind or of switching one type of animal into another kind by a change in environment, were also suggested by the Greeks.

The ancient Greeks may be excused, perhaps even admired, Dr. Coonen believes, for "probing and postulating among the riddles of genetics," since their reference libraries had no information to guide them. Lysenko, however, "has mountains of valid data, which he ignores. His claims are really all Greek to us," Dr. Coonen reports in *Science* (May 14).

Science News Letter, May 29, 1954

PUBLIC SAFETY

Night Glowing Clothing Saves Children's Lives

▶ CLOTHING THAT glows in the dark is "one of the finest developments for pedestrian safety in recent years," the Iowa State College Driving Laboratory has determined.

"Every parent should investigate night glowing materials for their children's protection," Dr. A. R. Lauer, professor of psychology and director of the Laboratory, has said. Materials are now available for clothing use that reflect 150 times as much light as a white painted surface.

"Visibility is the one factor that stands out above everything else in pedestrian deaths," Dr. Lauer said. "No driver with his car under control will hit a person on the road he sees clearly and in sufficient time to stop or dodge him."

Collars, yokes, cuffs, glove backs, badges, monograms and other markers can be woven into, sewn on or attached by adhesive to clothing, thus making a pedestrian very conspicuous to a driver at night if any light at all falls on him from the headlight beam.

In daylight, colors of the materials vary in shades from navy blue to yellow. The reflectorized material as such is hardly visible in daytime, but at night shows up with dazzling brilliancy. One manufacturer is making stocking caps that shine like reflectorized signs and can be seen at a much greater distance than even white clothing.

Even during the lessened hours of darkness in spring and summer, approximately one-third of pedestrian fatalities occur in darkness.

It has long been known that pedestrian deaths increase sharply as hours of darkness increase in the fall. In 1953, 53% of urban fatal accidents involved pedestrians. Even in rural areas, 13% of fatal accidents involved pedestrians. For November, January and February about two-thirds of pedestrian deaths occurred at night.

Science News Letter, May 29, 1954

PSYCHOLOGY

Do Not Worry—World Not Getting More Stupid

▶ IF YOU have been worrying that the world's people are getting more stupid with every generation, you can stop.

A group of UNESCO scientists has reviewed the evidence and concluded "that at the present time there is no basis for pessimism." The group has advised the World Population Conference which will meet in Rome next September that "there need be no great concern over an impending decline in intelligence."

Fears of a generally declining level of intelligence have been based on finding, in all countries where tests have been made, that the more children in a family, the lower the intelligence level. But the studies have not taken all factors into account, the UNESCO group believes. They point, also, to surveys in Scotland of the intelligence of all 11-year-old children. No decline was found in the 1947 survey from the average in a comparable survey 15 years earlier.

The UNESCO group's findings are reported by the American representative, Dr. Dael Wolfle, of the American Association for the Advancement of Science, in *Science*, (May 14).

Science News Letter, May 29, 1954

GENERAL SCIENCE

Indians Campaign for International Language

▶ INTEREST IN Interlingua as a means of scientific communication has resulted in students at Christ Church College in Kanpur, India, organizing a campaign for the support of this international language.

Information has reached Dr. Forrest F. Cleveland, Illinois Institute of Technology professor of physics, from Dr. L. Singh, professor of physics at Kanpur, that more than one-fifth of the 1,500 students of the college have contributed to a fund to help finance the introduction of this relatively new international language. No student was allowed to contribute more than the equivalent of five cents in American money.

Interlingua came to the attention of the college in India through the receipt of *Spectroscopia Molecular*, the first scientific journal to be published in Interlingua, of which Dr. Cleveland is editor.

Science News Letter, May 29, 1954

IN SCIEN

ECOLOGY

Parachute Beavers in Remote Mountain Areas

▶ PARACHUTING BEAVERS into remote mountain areas is the latest method of locating these helpful animals.

As soon as the parachute spreads out on the ground, the beavers are out of the box in which they drifted to earth and off on an eager search for homes in suitable streams. Idaho has used the method with success.

The beavers are taken from over-populated areas or from regions with too many dams. Planted in inaccessible areas by air, they can build all the dams they want. Their activity is very useful to man, since water storage reservoirs built in the mountains aid inhabited territories below.

Beavers were formerly transported into the wilderness by pack horse. This was hard on the animals, since they overheat and die easily. Transported quickly by air, the beavers seem to thrive on parachute jumps. The method is described by Dan Brogan in *Frontiers* (April).

Science News Letter, May 29, 1954

INVENTION

Soil Bacteria Aid to Oil Deposit Location

▶ LOWLY SOIL bacteria can be used as a tool to locate oil deposits.

Dr. Raymond J. Strawinski, a bacteriologist at Louisiana State University, has patented a method of determining the presence of gas in the soil by examining microorganisms.

Geologists have long supposed that the gas found with underground oil deposits seeps through the earth to the surface in small amounts. Dr. Strawinski reasoned that bacteria in the soil might feed on this gas.

Soil samples taken at a two-foot depth are incubated in a mixture of oxygen, carbon dioxide and any of the hydrocarbon gases such as methane, ethane, propane or butane. The rate of hydrocarbon gas consumption in the soil sample is then measured. The test is completed in a week or two.

The method cannot point out the exact location of the oil deposit, since the escaping gas does not necessarily rise directly to the surface. Experience has confirmed, however, that oil is in the immediate vicinity of hydrocarbon-consuming organisms, Dr. Strawinski said.

Primary advantages of the method are its simplicity, lack of expense and the quickness with which the test can be completed.

Science News Letter, May 29, 1954

CE FIELDS

PHYSICS

Heavier Particles May Create New Elements

► HEAVIER AMMUNITION used against atomic nuclei in new reactors will produce new forms of the elements, and possibly new elements now unknown, in the linear accelerators just authorized for Yale University and the University of California.

Hydrogen and helium, today's lightest elements, will be replaced as atomic bullets in the new machines by heavier particles ranging from beryllium to neon. These heavier bombarding particles will do more damage to the hearts of heavier elements like uranium, and a variety of new element forms should result.

Preliminary experiments with atomic ammunition of this caliber have already produced the new chemical elements, numbers 99 and 100. (See SNL, Feb. 20, p. 115, and March 6, p. 147.)

Heavier bombarding particles have a better chance of being added to the nucleus of an atom like uranium, thus adding considerable weight to the nucleus, than have repeated additions of light particles like hydrogen.

New isotopes of chemical elements produced by the machines just authorized by the Atomic Energy Commission will be used principally for chemical studies of the novel forms of elements that will result.

Science News Letter, May 29, 1954

ORNITHOLOGY

Wax-Eating Bird From Africa May Fight TB

► WAX-EATING BIRDS of Africa, known as honeyguides, are being enlisted in the fight against tuberculosis.

Dr. Herbert Friedmann, curator of birds of the Smithsonian Institution, Washington, is arranging for live honeyguides to be flown to the Army Medical Center in Washington for study.

The African greater honeyguide is distantly related to the North American woodpeckers.

It is one of two known living creatures that can digest wax, the principal food that it obtains from bees' nests. Studying it may provide clues for cracking the wax armor of the tubercle bacillus which makes the white-plague germ immune to most chemical treatments.

Scientists at the Army Medical Center hope to learn what makes this digestion possible. Either intestinal microorganisms, possibly of some unknown species, or hitherto unknown enzymes are suspected, and if they can be identified, they may have a role aiding medication aspects of the treatment of tuberculosis.

Dr. Friedmann has made an intensive study of the extremely curious behavior of the honeyguide in its native haunts. It long has been asserted that when this bird locates a bees' nest, which must be broken open before it can feast on the wax, it deliberately seeks out a human being, attracts his attention by some sort of demonstration, and then "guides" him to the treasure. The man, the bird was thought to assume, will break open the nest to get the honey. The honeyguide itself is not a honey eater.

Science News Letter, May 29, 1954

PSYCHOLOGY

Neurotics Need Not Take to Drinking

► NEUROTICS AND others with psychological difficulties do not have to take to drink, as witness the Jewish people who are noted both for their sobriety and for a high incidence of neurosis and psychological problems, Charles R. Snyder of the Yale University Center of Alcohol Studies, New Haven, Conn., declared at a meeting of the Harvard department of health, Cambridge, Mass.

Jewish people rarely become alcoholic because drinking is part of their religious ritual, and because the pressures operating on them as a minority group make for sobriety, Mr. Snyder explained.

Science News Letter, May 29, 1954

GENERAL SCIENCE

Loyalty Suspects Barred From Science Grants

► VERY QUIETLY but effectively, scientists who have been liberals and subject to political gossip are being cut off from subsidies for scientific research.

These are not just Communist Party members or Fifth Amendment "communists."

In the red-hunting atmosphere of today, government agencies, colleges and research institutions are inclined to take no chances with investigations. Information reflecting on the loyalty of the individual, even though uninvestigated, is enough to prevent a renewal of a grant under which the individual has been working.

Since much of America's scientific and technical research and development is done under government grants today, this is equivalent to firing the scientists.

The researches thus stopped are non-secret or "unclassified" projects usually of a fundamental or basic nature. They may be in physics, chemistry, biology or medicine.

Secret research for defense and other agencies in the years since World War II has been done only by those who have had rigorous security clearances. Fellowship grantees undergo security checks, even on non-secret work in some cases.

Science News Letter, May 29, 1954

GENERAL SCIENCE

23 Teen Age Scientists Win Summer Training

► FROM AS far away as Arizona, Nebraska and Alabama, 23 scientifically gifted high school boys and girls will come to Bar Harbor, Me., in June for 10 weeks of tuition-free training in research at the Roscoe B. Jackson Memorial Laboratory.

Competitively chosen, the 15 boys and 12 girls will have an opportunity to test their aptitude for a scientific research career.

Since the Jackson Laboratory is the world's "Bureau of Standards" for originating, producing and maintaining uniform animal material, the students will also have unique experience in working with and studying the laboratory's huge stocks of pure-bread strains of mice and other animals.

Student expenses consist only of a modest fee of $150 for ten weeks' board and room, and travel expenses to and from Bar Harbor. The total cost of the training program, however, which is five times this amount for each student, is included in the annual operating budget for which the Laboratory must seek public support.

Science News Letter, May 29, 1954

TECHNOLOGY

"Canned" Pump For A-Plants

► THE COMPLETE information needed to build a "canned" pump such as used in atom-powered submarines is now available from the Atomic Energy Commission's Pittsburgh office, the AEC has announced.

The canned motor pump is absolutely leak proof. It was so designed to protect crewmen aboard the USS Nautilus. Contained in the can is the motor that circulates hot water or liquid metal from the reactor to the boilers and back again. The fluid being pumped lubricates the bearings.

Science News Letter, May 29, 1954

NUTRITION

Scientists Go on Milk Diet for Month

► YOU CAN stay healthy and active on a diet of nothing but pasteurized cow's milk, but a month of it becomes monotonous, Drs. R. Hecker and W. H. H. Andrews of the School of Tropical Medicine, Liverpool, England, found.

Dr. Andrews drank 12 pints of milk daily and gained five pounds. Dr. Hecker drank 10 pints daily.

One of them played competitive tennis throughout the whole period and even traveled to London for the Coronation, having to sit all day in Hyde Park drinking milk.

Adults living on a high fat diet consisting of cow's milk absorb a normal proportion of their fat intake, the scientists report in the *British Medical Journal* (May 15).

Science News Letter, May 29, 1954

ENTOMOLOGY

Hundred Years War on Insects

Century-long battle has seen entomologists stop most insect-carried diseases. Yellow fever was one of the biggest victories. Farm loss from insects is $4,000,000,000 each year.

► FOR 100 years the science of entomology has waged ruthless warfare in this nation against a savage natural enemy. This enemy carries deadly diseases and horrible plagues, destroys crops, undermines homes, ruins clothes and banishes comfort. The enemy's shock troops are a vast array of insects — "bugs" in familiar but inaccurate terminology.

The organized attack on insects began with the appointment of Dr. Asa Fitch as entomologist for New York on May 4, 1854. On June 14 that year, Towend Glover became the first entomologist appointed by the federal government.

After a century of fighting how does the battle stand?

Farm losses to insects are estimated to be $4,000,000,000 each year. Without the controls developed in the last century, insect losses would be half the total annual farm production of about $40,000,000,000.

These controls have achieved the almost complete conquest of malaria, yellow fever, bubonic plague, epidemic typhus and other scourges of mankind that are spread by mosquitoes, flies, lice, ticks and fleas.

In 1873, 13,000 persons died in a yellow fever epidemic in the Mississippi Valley. Medical research indicted the mosquito as the carrier of the disease, and entomologists worked out methods for controlling the mosquito. As a result, the last epidemic of yellow fever in the United States was in New Orleans in 1905.

Early Insecticide History

While the most sensational successes of science in this war have been won on the disease front, scientists have pressed for more knowledge and better control methods in every field that man finds himself at a disadvantage with the insect.

DDT captured the public imagination so completely with its successes during World War II that many have forgotten the earlier history of insecticides. None were as effective as DDT, but they marked important gains.

By the time of the Revolutionary War, farmers knew that the nicotine in tobacco would kill soft-bodied insects. With the appearance of the scientists on the field of battle, the old stand-bys of pyrethrum, oils and arsenic compounds were developed. Most of these came on the scene as insect-killers in the 1860's.

One of the most significant of these earlier discoveries came in 1892 when the late Dr. L. O. Howard began making large scale tests with oil spread on water in mosquito-breeding areas. Recommendations stemming from his research led to the world-wide use of oil as a killer of mosquito larvae, and helped wipe out yellow fever and reduce malaria in this country. In 1894, Dr. Howard became chief entomologist of the U. S. Department of Agriculture, a post he held until 1929.

Insecticides came into their own, though, with the comet-like appearance of DDT. Credited with preventing an outbreak of epidemic typhus during the mass dislocation of people and armies in the war, DDT at first appeared to be a complete and universal weapon against the insects.

Resistant Strains Developed

The devilish response of the insects to this new threat was unfortunately soon apparent. They simply developed strains resistant to DDT and shrugged it off like so much talcum powder. Certain important insects, such as the boll weevil, never were killed by DDT.

In spite of the insects' genetic ingenuity, the scientists knew a good lead when they saw one. Quickly an insect-man armament race started and, as resistant strains developed, the scientists came out with new offensive weapons.

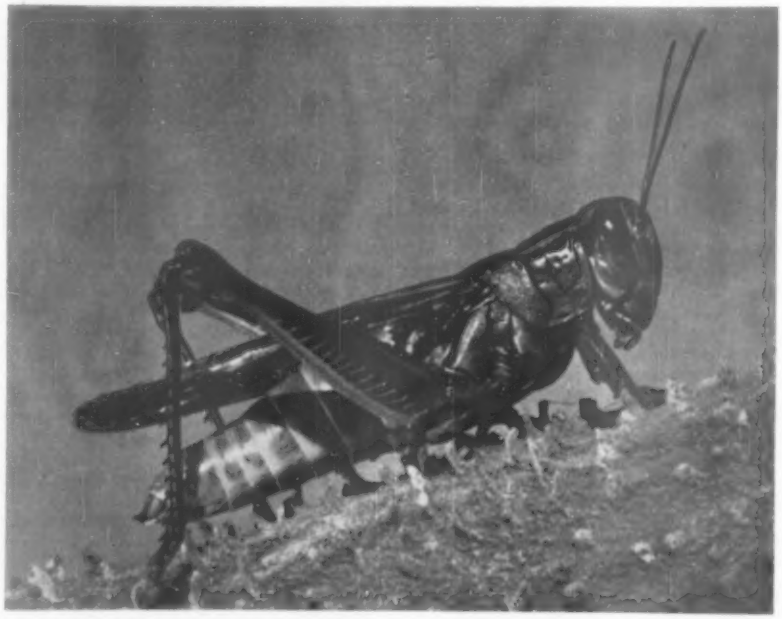
This large and growing arsenal of insecticides, based on the DDT chlorinated hydrocarbon principle, includes methoxychlor, TDE, BHC, lindane, chlordane, aldrin, dieldrin, endrin and heptachlor. Each has a particular group of insects against which it is most effective, but there is no reason to believe the insects will not gradually evolve a resistant strain.

Organic Phosphorus Chemicals

An important new development has been schradan, an organic phosphorus compound. Sprayed on the plant or soil, schradan is taken into the plant and transported to the leaves and stem. When the attacking insect starts to suck the plant's vital juices, it gets the poison.

It is called a systemic insecticide. Its possibilities are great. The primary advantage is the obvious absence of continual spraying. Wide use of schradan is held up until the problem of residues in food that might be harmful to man is cleared.

Another early development that is being intensively exploited is biological control. This is the entomologist's way of saying fight an insect with another insect.



TWO-STRIPED GRASSHOPPER — Grasshoppers have caused concern among men since the beginning of recorded history. The one shown here is known to entomologists as Melanoplus bivittatus.

All over the world explorers from the Department of Agriculture are looking for insects to send back—insects that eat insects already here. Some of these parasites have already been found.

Since 1888, more than 100 parasites have been successfully established on about 40 different pests in this country. The vedalia beetle from Australia saved the early California fruit industry by devouring the cottony-cushion scale. The other parasites artificially introduced have not been quite so effective, although they have simplified some control problems.

At present entomologists have great hope that parasites of the European corn borer and the pink bollworm can be established to help control these multi-million dollar pests.

The future could get very complicated with a combined insecticide-parasite approach. The problem is how not to kill off your parasites with your pests.

There are still plenty of mosquitoes to whack in summer and pests to bedevil the farmer, but accomplishments so far represent signal victories for man over his ancient enemy. The victories have been won by a very small army.

Bar at Entrance Port

Fewer than 1,000 persons today work full-time in research on insect problems. In its 100 years, the profession of entomology has had less than 6,500 members. What they lacked in numbers, these scientists possessed in ingenuity, scientific ability and determination.

It early became apparent to them that most of the serious insect pests were not natives to this country. In 1865, Glover suggested that all seeds and foreign plants be investigated at the port of entry for harmful insects. With frightening accuracy, he said, "One pair of new noxious insects will do more harm than hundreds of well-known varieties."

Congress did not get around to passing plant quarantine legislation until 1912. Among the harmful insects that entered the country between 1865 and 1912 were the gypsy moth, sweetpotato weevil, California red scale, greenbug, horn fly, boll weevil, European corn borer and Japanese beetle. Their total "take" from the nation today is close to $1,000,000,000 in an average year.

Not all of these could have been stopped, since some serious insects have entered in spite of inspection and quarantine. However, there is no doubt that early action on Glover's suggestion would have kept most of them out. In 1949, the corn borer did $350,000,000 damage; the boll weevil hit a peak in 1950 with damage estimated at $750,000,000. These are not small items in the nation's economy.

Came Over on Mayflower

Naturally many of our destructive insects came from Europe on the Mayflower and other ships. Lice, fleas, bedbugs, fabric pests such as clothes moths, house flies, ants and cockroaches are among this group of "colonizing" insects.

We owe the Hessian fly indirectly to the Redcoats. It came over with the German mercenary troops the British hoped would help win the Revolutionary War for them. As soldiers, the Hessians were not very successful, but the Hessian fly has made up for this by becoming one of our worst wheat pests.

The insects have been cagey enemies, responding to every new scientific offensive with a strong defensive, but it is not too much to say that the scientific successes in the 100-year war have helped this country become one of the strongest, and its people among the healthiest and best fed anywhere on earth.

Science News Letter, May 29, 1954

BIOCHEMISTRY

Clumped Blood Cells Show TB in New Test

▶ A SUCCESSFUL blood test for diagnosing tuberculosis was announced by Dr. James F. Morris of Fort Douglas Veterans Administration Hospital, Salt Lake City, at the meeting of the National Tuberculosis Association in Atlantic City.

The test depends on the clumping of red blood cells suspended in diluted serum from the patient's blood. When tried on 54 patients, only one false positive and one false negative resulted.

This test is a modification of the Middlebrook-Dubos test developed several years ago. In this first version, red blood cells from sheep sensitized to tuberculin were suspended in patient's diluted blood serum. If the cells clumped, it was believed to show the presence of the disease.

When the red cells from the patient were substituted for the sheep cells, the test gave "reliable results as a diagnostic procedure," Dr. Morris reported. The use of sheep cells did not give a valid test for active tuberculosis.

The new test is most reliable, Dr. Morris found, in patients with early active lung infiltration, miliary tuberculosis and tuberculous meningitis.

Dr. Morris began his studies of a TB blood test at the Trudeau Sanatorium, Trudeau, N. Y., and continued it at the University of Rochester, N. Y.

Science News Letter, May 29, 1954

TRANSPARENT
PLASTIC BOXES

Write for Data TPB-SNL

R. P. CARGILLE LABORATORIES, INC.
117 Liberty Street, New York, N. Y.

SAVE UP TO 85% ON GOV'T SURPLUS

100 - 200 - 300 POWER
REVOLVING TURRET
MICROSCOPE

AN UNSURPASSED VALUE ! The three revolving objective lenses allow a selection of 100, 200 or 300 POWER magnification. Rack and pinion focusing – right and left hand. Adjustable substage mirror. All metal body built to incline through 90°. Complete in a sturdy, dove-tailed hardwood case. Your satisfaction guaranteed. Only 9.49

BINOCULAR
DISSECTING
STEREOSCOPIC
MICROSCOPE

Only $49.95
SATISFACTION GUARANTEED!

A top quality, imported Prismatic Binocular Head and Microscope. Micro-engineered and designed for finest stereoscopic performance. Has fine gear tooth adjustment to insure an even micro-focus. Ground, polished, micromatic 5X objectives, plus 10X eyepieces gives full 50 power magnification. Sturdy, solid base – all-metal construction. Side arm rests included for delicate and long work. Complete in hardwood case. Ideal for Biology, Botany, Zoology, Embryology, Bacteriology, Dermatology, Entomology, etc.

M-X490 EXTRA EYEPIECE SET
For Stereoscopic Microscope above. Has 4 paired eyepieces (8 pieces) of 4X, 8X, 12X & 15X. Complete in hardwood case. 16.95

ONLY A SAMPLE – Microscopes shown here are only a part of our stock. Others range up to 2000 power. Send for our Catalog TODAY!

NAVIGATORS MAGNETIC COMPASS

Type P-11. Designed for use in British Navy. Has a rotating gyro ring, calibrated in 1° increments, from 0 to 360°. Two luminous grid wires for N-S and two for E-W alignment. Three foot mounts. Ideal for use on small boats. Another Amazing PALLEY SURPLUS BARGAIN. Like New. 9.95

Order from this Ad. Pay by M.O. or Check. P.O's accptd. from D&B firms. 1/2 dep. with C.O.D's. All prices F.O.B. Los Angeles, California.

WORLD'S MOST AMAZING BARGAIN CATALOG
SAVE UP TO 85% ON WAR SURPLUS
1954 EDITION—OVER 320 PAGES

Packed with SENSATIONAL VALUES in WAR SURPLUS, FACTORY CLOSE-OUTS and GENERAL MERCHANDISE! Fully Illustrated. Thousands of items in Hand & Power Tools, Outdoor & Sporting Equipment, Hardware, Photo Supplies, Foam Rubber, Industrial Tools, Aircraft Parts, Metals, Plastics, Gadgets, Hydraulic Supplies & many, many more.

Only 50¢ To cover Handling & Mailing. Refunded with first order.

PALLEY SUPPLY CO.
2263 E. Vernon Ave., Rm. T4E
Los Angeles 58, Calif

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANIMAL CONTROL IN FIELD, FARM, AND FOREST—W. Robert Eadie—*Macmillan*, 257 p., $3.75. Almost any wild animal can create a special problem at certain times and in particular situations. Here are suggestions on effective action against each type of predator.

AUTOTROPHIC MICRO-ORGANISMS: Fourth Symposium of the Society for General Microbiology Held at the Institution of Electrical Engineers, London, April, 1954—B. A. Fry and J. L. Peel, Eds.—*Cambridge University Press*, 305 p., illus., $5.00. Autotrophs are those bacteria whose primary source of energy is the sun or energy released in simple inorganic oxidation reactions. They are of extreme importance in maintaining fertility of the soil.

BUILDING A BALANCED COMMUNICATIONS PROGRAM: With a Paper on The Evolving Picture in Labor Relations—J. L. Atwood and others—*American Management Association*, 44 p., paper, $1.25.

THE CHALLENGE OF A BUYER'S MARKET—Eugene Caldwell and others—*American Management Association*, 71 p., paper, $1.25. Stressing the value of research and improvement of quality in a hard-to-sell period.

FIFTY YEARS OF TECHNICAL ASSISTANCE: Some Administrative Experiences of U. S. Voluntary Agencies—Edwin A. Bock—*Public Administration Clearing House*, 65 p., $1.50. Based on interviews with 55 persons with long experience in less-developed countries. Protestant denominational groups spend more money for this purpose than the United Nations.

4,000 YEARS UNDER THE SEA—Philippe Diolé, translated by Gerard Hopkins—*Messner*, 237 p., illus., $4.50. After thousands of years of fear and effort, man has at last succeeded in getting beneath the top layer of the sea, giving him the opportunity of reconstruction from the ocean floor of the submerged secrets of ancient civilizations.

HISTOLOGY—Roy O. Greep, Ed.—*Blakiston*, 953 p., illus., $15.00. Originally intended as a 6th edition of Bremer and Weatherford "A Textbook of Histology," it became a completely new book in preparation. For medical and dental students.

HISTOPATHOLOGIC TECHNIC AND PRACTICAL HISTOCHEMISTRY—R. D. Lillie—*Blakiston*, 501 p., $7.50. By the medical director of the U. S. Public Health Service.

THE JUVENILE OFFENDER: Perspective and Readings—Clyde B. Vedder—*Doubleday*, 510 p., $6.00. Dealing with an old problem but one over which the public has become deeply concerned—why and how young people get started on the road of crime and what can be done to correct or help them.

MANAGEMENT AT MID-CENTURY: Business Leadership's Obligations and Opportunities—Lawrence A. Appley, J. Wilson Newman and James P. Mitchell—*American Management Association*, 31 p., paper, $1.25.

THE MEASUREMENT OF PARTICLE SIZE IN VERY FINE POWDERS—H. E. Rose—*Chemical Publishing Co.*, 127 p., illus., $2.75. Based on a course of public lectures at King's College, University of London, this small book reports the author's own researches and also surveys the whole field.

PESTICIDE HANDBOOK 1954—Donald E. H. Frear, M. Frances Sunday and Sidney Friedman—*College Science Publishers*, 6th ed., 196 p., paper $1.25, cloth $3.00. This completely revised edition lists 5,763 products and tells about their chemical composition, compatibilities and hazards.

PROCEEDINGS OF THE SECOND INTERNATIONAL CONGRESS ON RHEOLOGY: Oxford, 26-31 July, 1953—V. G. W. Harrison, Ed.—*Academic Press*, 451 p., illus., $10.00. On the deformation and flow of matter, dealing particularly with plastics and high polymers as well as lubricants, clays, metals, diamonds and protoplasm.

SOCIAL PSYCHOLOGY—Otto Klineberg—*Holt*, rev. ed., 578 p., $5.25. Bringing up-to-date the author's textbook. Chapters on delinquency, prejudice and the implications of psychological findings in international relations will appeal to a much wider public than college students. (See p. 338.)

THE SULPHUR DATA BOOK—William N. Tuller, Ed.—*McGraw-Hill*, 143 p., $5.00. A reference book of data on the characteristics and processing of sulfur. Prepared for engineers, chemists and students.

SYMBOLS AND VALUES: AN INITIAL STUDY: Thirteenth Symposium of the Conference on Science, Philosophy and Religion—Lyman Bryson and others, Eds.—*Harper*, 827 p., $6.00. The type of symbols considered at this conference are those intended to evoke or sustain a mood or an attitude. The uses of symbols are many, but they are also liable to abuses.

A TEXTBOOK OF RADAR—E. G. Bowen, Ed.—*Cambridge University Press*, 2d ed., 617 p., illus., $8.50. A collective work by the staff of the Radiophysics Laboratory, C.S.I.R.O., Australia. Development of radar in England was a consequence of a carefully planned policy inspired by recognition of the danger of air attack. Although developed independently in the U. S., radar equipment in both countries was completed at about the same time and was strikingly similar.

VERTEBRATE DISSECTION—Warren F. Walker—*Saunders*, 331 p., illus., $3.50. A laboratory manual with a systematic plan intended to show the transformations which have occurred in the course of evolution.

WILD FLOWERS: And How to Grow Them—Edwin F. Steffek—*Crown*, 192 p., illus., $3.95. Telling what you can do to prevent the complete disappearance of many of our choice wild flowers. Hints on how to find and identify the flowers of woods and field, and how to make them grow in your own garden.

THE WORLD'S FOOD: A Study of the Interrelations of World Populations, National Diets, and Food Potentials—M. K. Bennett—*Harper*, 282 p., illus., $4.00. This expert on food economics takes a less gloomy view than many on the problem of how to feed the growing numbers of hungry mouths and so reduce the threat of future disorders and wars.

Science News Letter, May 29, 1954

BIOCHEMISTRY

Calorie Handling Regulator Inherited

A REGULATOR for the rate at which calories are burned or stored in the body is inherited. Dr. Paul F. Fenton of Brown University, Providence, R. I., has discovered this to be the case for mice, at least.

Along with a natural tendency to obesity goes a susceptibility, in the mice, to some kinds of cancer, he found. The same mechanism may control both conditions.

Other scientists have found that fat humans develop more cancer than thin ones, American Cancer Society officials pointed out when they announced results of Dr. Fenton's research, which the society helps support.

Dr. Fenton suspects that the mechanism that produces fat and cancer may be hormonal. He has found that sugar, injected into mice, disappears slowly from the blood streams of fat, cancer-susceptible animals and rapidly from the blood of thin, cancer-free animals.

Insulin burns blood sugar. Dr. Fenton believes that mouse obesity may be accompanied by an under-production of insulin by the pancreas or by an over-production of anti-insulin hormones by the cortex of the adrenal glands that lie atop either kidney.

Because he finds an excess of protein and minerals, as well as fat, in the tissues of cancer-susceptible animals, he believes that the tiny pituitary glands of these mice may produce excessive amounts of growth hormone.

In his earlier experiments, Dr. Fenton showed that the tendency toward obesity in cancerous strains of mice and leanness in non-cancerous strains was apparent, regardless of whether the animals over-fed or under-fed.

Science News Letter, May 29, 1954

CHEMICAL INVENTORS:—

You supply the product, we'll be your factory.

- Powder and liquid filling
- Labelling and mailing
- Cellophane wrapping
- Printing and paper boxes

The Sparks Corporation

Shurs Lane and Pechin Street
Philadelphia 28, Pa.
IVyridge 3-7830

Packagers of Things of Science

STOP BEING CONFUSED!

FREE BOOK

New Book tells all about High Power BINOCULARS Know BEFORE you buy

Newest Precision Optics
A Million Thrills
33 Models $9.95 to $125
Guaranteed Savings
Ask for Dealer's Name

FREE TRIAL Plan

BUSHNELL Binoculars

Dept. 847 43 E. Green Pasadena, Calif.

How To Select BINOCULARS

FILL OUT! Mail TODAY!

NAME
ADDRESS
CITY STATE

MEDICINE

Save Eyes of Babies

▶ THE EYESIGHT of many babies, especially premature ones, can be saved by cutting down the amount of oxygen given them during the first two weeks of life. This can be done, moreover, without running any extra risk of the babies dying from oxygen lack.

A controlled, year-long study showing both these facts is reported by Drs. Jonathan T. Lanman, Loren P. Guy and Joseph Dancis of Bellevue Hospital and New York University College of Medicine, New York, in the *Journal of the American Medical Association* (May 15).

Their study is apparently the first controlled one showing excess oxygen to be the cause of the serious and usually blinding eye disease, retrolental fibroplasia. This ailment, called RLF for short, was first recognized as a disease of premature infants in 1942.

"It is now first among the causes of blindness in children in the United States and is the foremost problem other than death itself in the care of premature infants," the New York doctors declare.

Starting in 1949, several physicians have reported a link between RLF and intensive oxygen treatment. There has also been a theory that lack of female hormone might make premature babies more susceptible to RLF. Because they are born early, these babies would not get as much of the hormone from their mothers as full term babies.

The New York doctors made a controlled test of both theories. All babies weighing between 2.2 and 4.1 pounds at birth and less than 12 hours old when admitted to the Bellevue Hospital premature nursery were assigned by random numbers to: 1. high oxygen treatment; 2. high oxygen plus estrogen (female hormone); 3. low oxygen; and 4. low oxygen plus estrogen.

The estrogen had no effect on either survival or development of RLF.

The oxygen did. Of 36 babies getting the modern conventional high oxygen treatment, eight developed irreversible RLF in both eyes. Six of them are blind. Two may have useful vision in one eye.

No case of RLF developed in 28 babies with low oxygen concentration treatment.

The theory, held by doctors for a number of years, that extra oxygen helps many premature babies survive, is also challenged by the Bellevue study. The over-all mortality in the group getting high oxygen treatment was 20%, compared with 30% in the group on low oxygen. This difference, however, disappears when five infant deaths, due to known causes, are excluded.

Science News Letter, May 29, 1954

Science Leaps Barriers of Language With Journal, Scientia International

Monthly Edition of *Science News Letter* in Interlingua

Scientia International carries the news of science to the non-English speaking areas of the world. Appearing monthly, it can be read by anyone anywhere. Terse, packed with information, it contains careful selections from the English-language weekly edition.

Subscribe to Scientia International for friends abroad. A gift card will be sent in your name.

Subscription to Scientia International is only $2 a year. For airmail transmission, add the actual cost of 12 half-ounce airmailings: $1.20 airmail postage for Latin America, $1.80 for Europe and $3.00 for the Near and Far East and Africa, etc.

Help the free international flow of scientific information by subscribing to Scientia International for friends and acquaintances in non-English speaking countries abroad. In other countries there is no journal like Science News Letter. But now you can supply them with one in a language which is not their native tongue but which they can read with utter ease.

Take out a subscription to Scientia International for yourself and keep up with the progress of the first periodical appearing in Interlingua.

Send as gift in my name SCIENTIA INTERNATIONAL to the following by ☐ Regular Mail ☐ Air Mail

Send gift card in name of:

Name_____ Name_____

Address_____ Address_____ Donor's Name_____

City_____ City_____ Address_____

Country_____ Country_____ City, Zone, State_____

☐ Enter my subscription also. ☐ Bill me. $_____ enclosed. ($2 for each subscription, plus airmail postage if ordered.)

Mail to SCIENCE NEWS LETTER, 1719 N Street, N.W., Washington 6, D. C. 5-29-54

ENTOMOLOGY

NATURE RAMBLINGS

Ants

▶ THE NEXT time an ant takes a short cut across your picnic cloth, it may put matters into perspective to reflect that ants were here before we were. Long before.

On the evidence of ant fossils preserved in amber, it is known that at least thirty million years ago ants were living together just as they are today, in large communities, with a caste system, with division of labor. Man is a mere Johnny-come-lately, with a scant million years behind him.

Ants are prodigious athletes in proportion to their size. They can lift a weight 400 times their own weight. If weight increased in direct proportion to size, a five-pound ant could easily lift a ton.

Despite their small bulk, ants display a great range of size from the smallest ant to the largest, even within the same species. The largest ant of a species may weigh several thousand times more than the smallest. Among humans, even considering obese giants at one extreme and dwarfs at the other, the factor does not exceed 30 times.

Ant colonies consist of not just two, but three sexes: males, females, and neuters. The neuters, who are the workers, are anatomically female, but sterile. The so-called queen is a sexually mature female. There may be several such fertile females in an ant colony.

The workers are wingless. Only the males and females have wings, which are used but once, during the nuptial flight. Shortly before swarming time, males and females will be produced in great numbers. The colony is a bustle of activity. The workers keep the adults in check until the weather is propitious.

Warm windless days seem to be preferred, because when such a day comes, from all ant colonies in the neighborhood clouds of males and females will swarm skyward in the nuptial flight.

Males and females pair off in what is destined to be the first and last youthful fling for both of them. The female will immediately burrow herself a home in the earth or move in on an established colony. In any case, she will keep the sperm she received on her nuptial flight in a special pouch in her body, and will use them to fertilize all the eggs she will produce for the rest of her life.

The bridegroom, having fulfilled his biological destiny, wanders off, loveless, homeless and alone, doomed to an early death.

If it is warm and airless the day of your picnic, take a close look at the ant before you flick him off into the tall grass. If he has wings, he is probably a bridegroom, perhaps dazed at the breath-taking brevity of his honeymoon. If he has wings, treat him gently, for his hours are numbered.

Science News Letter, May 29, 1954

JOIN the rapidly increasing group of readers of the Mathematics Magazine. Its broad coverage, ranging from easy problems and elementary papers thru advanced research, contains matters of interest and profit for the entire family of mathematicians. Whether mathematics is your business or your hobby, you'll find help and opportunity in the Mathematics Magazine.

Send $3.00 to:

MATHEMATICS MAGAZINE, Dept. C
14008 Van Nuys Blvd., Pacoima, California

for one year's subscription and an "Understandable" article on almost any classic course in mathematics (send alternative) e.g. trigonometry, calculus, topology et cetera.

Questions

BIOCHEMISTRY—What clue to drug addiction have radioactive morphine studies given? p. 341.

□ □ □

ECOLOGY—How are beavers now being introduced into new territories? p. 344.

□ □ □

ENTOMOLOGY—What is the annual loss of farm crops from insects each year? p. 346.

□ □ □

GENETICS—Why are Lysenko's claims said to be "all Greek"? p. 344.

□ □ □

MEDICINE—What are advantages of using double drug combination to fight TB? p. 340.

What device may replace the familiar clinical thermometer? p. 341.

□ □ □

PHYSICS — Why use heavy particles for smashing atoms? p. 345.

□ □ □

PSYCHIATRY — What suggestion has been made for use of psychiatrists in courts? p. 340.

□ □ □

Photographs: Cover and p. 343, Purdue University; p. 339, Atomic Energy Commission; p. 341, Fremont Davis; p. 346, Clifford Matteson; p. 352, General Scientific Equipment Co.

AERONAUTICS

Speedy Short Lived Jets

▶ A SHORT but speedy life is forecast for jet planes of the future.

Because at five times the speed of sound, a supersonic airplane would encounter temperatures as high as 1,600 degrees Fahrenheit, tomorrow's fighters may be designed to last only a limited time, Dr. George Gerard of New York University's College of Engineering research division, predicted.

High temperatures beyond the "thermal barrier" will weaken materials used in the plane's construction, thus severely reduce its life span. Aircraft strong enough to withstand such temperatures would have to be substantially heavier and less maneuverable. Because of the weight problem, it may be necessary to design the airplane for limited life expectancy.

The "thermal barrier" is the region above Mach 2. Mach numbers express velocity in terms of the speed of sound in the surrounding atmosphere. Mach 2 is twice the speed of sound. At a speed of Mach 5 in the stratosphere, from about 35,000 to around 100,000 feet above the earth's surface, planes may be subjected to temperatures as high as 1,600 degrees Fahrenheit.

Although aircraft materials are capable of withstanding 1,600 degrees Fahrenheit, tremendous weight penalties may set a realistic limit at Mach 3.5, at which the temperature is 800 degrees Fahrenheit.

Over a period of time this intense heating, combined with stresses due to maneuvering and to atmospheric conditions, produces distortion or deformation of metal. Such creep progressively weakens the plane's components to the point where its useful life is ended.

A design philosophy of limited life span for aircraft would differ radically from that of present engineering, which attempts to produce planes that will last as long as possible. Commercial aircraft, for example, are planned for 20 years of flying service.

In flight tests, planes already have flown at speeds greater than Mach 2, the latest record being in excess of 1,660 miles per hour, for very brief periods. Although elevated temperatures were encountered, only sustained flights at such speeds will produce the severe effects of aerodynamic heating considered in the investigation.

For the Air Force's Air Research and Development Command, New York University investigators devised a method of analyzing aircraft life expectancy. Dr. Gerard pointed out that determining the loss of strength in supersonic aircraft structures involves complex measurement of different stress levels at various high temperatures during the life of the plane.

Scientists know qualitatively in general what these stress conditions will be, he said, but because data from actual flight is lacking, the magnitude and frequency of these conditions has not been determined.

Science News Letter, May 29, 1954

ASTRONOMY

Iron Curtain Breaks

Presence of two U. S. astronomers, as well as top astronomers from other countries, at dedication of Russian observatory believed to indicate break in Iron Curtain.

▶ A BREAK in the Soviet's Iron Curtain is seen by Washington observers in the presence of two top U. S. astronomers at the dedication of Pulkovo Observatory, near Leningrad in Russia, and celebration meetings (May 20-June 3).

It is the first time since 1946 that U. S. scientists have been invited to attend such a big scientific show, as far as leading scientists recall. And it is the first important astronomical meeting with foreign visitors to be held in the U.S.S.R. since before World War II.

Statesmen as well as scientists are keeping a careful watch on the ceremonies. Invitations to the functions were extended not only to U. S. astronomers, but also to astronomers from Canada, France, Great Britain, the Netherlands and Sweden.

Holding such a significant and important affair with foreign scientists in attendance would indicate that the Russians want other countries to know of their work and to cooperate with Russian scientists where possible, observers believe.

They interpret this break in the scientific Iron Curtain as a further indication that Russian policy has changed, that the curtain is gradually softening, that Soviet leaders now believe the two major powers can coexist on one planet.

The International Astronomical Union, an international organization of astronomers, had scheduled a meeting for Leningrad in 1951. Because of difficulties with arrangements, the international meeting was finally held in Rome in 1952, and some Russian astronomers did attend.

The two U. S. astronomers who are taking part in the Pulkovo Observatory dedication and meetings are Dr. Dirk Brouwer, director of Yale University Observatory, and Dr. J. J. Nassau, director of the Warner Swasey Observatory, Case Institute of Technology, Cleveland.

Their travel funds were a grant from the National Science Foundation, the National Academy of Sciences announced. During their two-week stay behind the Iron Curtain, Drs. Brouwer and Nassau will be guests of Dr. A. N. Nesmeyanov, president of the Academy of Sciences of the U.S.S.R.

Pulkovo Observatory was completely destroyed during World War II. It has now been rebuilt, and the elaborate program was planned by the Russian Academy to celebrate its reopening.

The meetings are particularly emphasizing astrometry and the study of variable stars. Variable stars are a key to the size of the universe, since they offer one means of telling just how far away other galaxies are from our own Milky Way.

Both Drs. Brouwer and Nassau are presenting papers at the meetings.

The Pulkovo Observatory was established in 1839 and has a distinguished history in the determination of precise positions of the brighter stars.

Astronomy is one of the scientific fields in which Russians pride themselves on being leaders, and practically all U. S. astronomers agree that they do very fine work.

Another indication of the break in the Iron Curtain, at least scientifically, is the reported invitation to British physiologists to visit a similar sort of meeting this spring in the U.S.S.R., although no U. S. scientists are known to have been invited. This meeting will also be a big show, officials at the National Academy of Sciences believe, but they do not know the details.

Science News Letter, May 29, 1954

AERONAUTICS

Jet Fighters Modified

▶ THE SPEED has been boosted on the Navy's scrappy little Cougar jet fighter. The plane already could fly faster than 650 miles an hour. The F9F-8's top speed is still secret.

Revisions worked out by the Grumman Aircraft Engineering Corporation not only pack more zip into the needle-nosed craft but also make it more elusive in combat. Furthermore, it now has a flying distance greater than 1,150 miles, the range of its F9F-6 granddaddy.

According to a company official, the new F9F-8 Cougar is more easily controlled at high subsonic, transonic and supersonic speeds. The available force for turning the craft in high-altitude flight has been doubled. To the pilot, this means exceptional maneuverability and a more formidable fighting machine.

The plane was modified by substituting fixed wing slats for the present movable ones. The wings' thickness was cut down, but the total wing area was raised by making the wing 15% wider.

The hydraulic gear formerly needed to operate the wing slats was removed, making room for 60 extra gallons of gasoline. An eight-inch addition to the plane's center section raised its gas-holding capacity another 80 gallons.

Grumman engineers now are "phasing in" the new F9F-8 on their production lines and are "phasing out" the F9F-6 and the F9F-7. The latter is powered by an Allison J33 turbojet. Both the F9F-6 and -8 are driven by Pratt and Whitney J48 engines.

The single-engine Cougar has a swept-wing span of 34.5 feet. It measures 41 feet 7 inches long and weighs 18,000 pounds.

A group of three Cougars flown by Navy pilots recently set a transcontinental speed record. The fastest plane swished from San Diego to New York in 3 hours, 45 minutes and 30 seconds.

The planes averaged about 650 miles an hour over the 2,438-mile hop, but radar clocked one of the planes at a supersonic 825 miles on hour. Part of this speed was attributed to a strong tail wind.

Science News Letter, May 29, 1954

REFRESHER COURSE IN MATHEMATICS

By F. J. CAMM

A basic course in mathematics, from arithmetic to the calculus, arranged logically and in order of difficulty. Explanations of principles are followed by worked examples.

Includes: treatment of fractions, decimals, square root and cube root, logarithms, progression averages, interest, algebra, equations, graphs, plane and solid geometry, trigonometry, differential and integral calculus; useful mathematical tables; summary of mathematical formulas; etc., etc.

Will be of enormous help not only to those who have forgotten their mathematics but also to those now acquiring it.

240 pages • 195 Illustrations
$2.95 Postfree • 5-day Money-Back Guarantee

EMERSON BOOKS, INC., Dept. 19-K
251 W. 19th Street, New York 11

3000 curiosities of nature explained

in this amazing $1.95 "cyclopedia"

Explorer sees dazzling green flame shoot up from horizon, stay in view ½ hour

Azure blue sunsets reported throughout world after volcano erupts in Japan

Botanist's child sees eerie orange light coming from flower petals

Almost all of us have wondered what lies behind phenomena like these. Now—for the first time—a book has been published in this country that gives the scientific explanations for these and 2997 other curiosities, most of them anomalies we can see for ourselves. Tells why falling snow is sometimes black . . . why the harvest moon is "bigger" . . . why mirages occur . . . why dead trees emit light . . . why shadows change colour . . . how to see the inside of one's own eyeball, etc., etc. "LIGHT AND COLOUR IN THE OPEN AIR" by M. Minnaert opens up a whole new world to those who are willing to re-educate their eyes, yet costs only $1.95, complete with 378 pages, 202 illustrations (including 42 photos). Send $1.95 to Dover Pub., Dept. 230, 920 Broadway, N. Y. 10, N. Y. for your paperbound copy. Add 10c to cover postage and handling. Money back in ten days if not delighted.

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 728. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

ALUMINUM FOIL, manufactured in 250-foot rolls in widths of 12 and 18 inches, is being marketed as a mulching material for home gardeners. The manufacturer reports it increased tomato yield 400% in one test, while decreasing certain types of insect and disease damage.

Science News Letter, May 29, 1954

KNUCKLE BANDAGE is a first-aid "specific" dressing for injuries on knuckles, fingers and finger joints. The H-shaped bandage is quickly and easily applied, and permits free movement of the hurt part.

Science News Letter, May 29, 1954

PASTE SOLDER is brushed on to the metal and heated, which can be done by oven, torch or iron. Made of tiny nugget-like particles of tin-lead, the paste will not harden in storage and yields a tight joint on iron, tin, zinc, copper, silver, nickel, galvanized finishes, brass, steel and some alloys.

Science News Letter, May 29, 1954

PAINT GELATIN is a revolutionary ingredient for paint manufacturers. It makes the paint jelly-like so it does not settle or drip from the brush or run down the wall. Yet when brushed on, the paint flows at the proper consistency and thickness.

Science News Letter, May 29, 1954

FACE MASK for tractor operators connects to the tractor's vacuum system and provides the wearer with a supply of filtered, cool air. The device, shown in the photograph, is designed to be comfortably worn all day without labored breathing. A moist sponge helps to cool the incoming air, and tests showed the air inside the mask was 83 degrees Fahrenheit one day while outside air temperature was 110.

Science News Letter, May 29, 1954

PLANNING SLIDE-RULE for the home gardener shows the user when to expect to harvest crops planted on a certain day in any of 10 climates. By reversing the process, he can figure out when to plant crops or flowers if he wants to harvest them at a certain time. The circular slide rule is made of a sturdy, water-resistant cardboard.

Science News Letter, May 29, 1954

SUPERSTRENGTH CEMENT is a "glue anything" waterproof adhesive ideal for model airplane builders, but useful for patching plastics, wood, leather, natural-fibered fabrics, wallboards, china, stone, tile, paper and many types of synthetic fabrics. In tests, two small pieces of wood that had been joined with it could later support an adult in a swing.

Science News Letter, May 29, 1954

LAZY SUSAN-coffee table combination is done in blonde maple and stands on 15-inch "self-leveling" wooden legs. The legs are removable so that the Lazy Susan can be used on the dinner table. The top, revolving on ball bearings, resists food acids, stains, alcohol and even cigarette burns.

Science News Letter, May 29, 1954

We wish to serve you—

LET US ORDER YOUR BOOK

5-29-54

Don't Delay

getting that NEW BOOK you want to read. SCIENCE NEWS LETTER will gladly obtain for you any American book or magazine in print. Send check or money order covering regular retail price ($5 if price is unknown and adjustment will be made). We will pay postage in the United States Mail us your order, listing title, author, publisher, price, and mail, with your complete return address, to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C.

Do You Know?

The human *eye* is covered by a film of tear fluid all the time.

Research reveals that the incisor teeth of the *pocket gopher* grow at the rate of 46 inches a year, or nearly an inch a week, but his vigorous gnawing keeps them worn down.

Future mining processes may permit entire rock formations to be mined and treated, and a number of *metals* recovered at once.

Mental illness is the most costly disease known to man in terms of social and economic losses.

Ammonia burns have become a new farm hazard since anhydrous *ammonia* has been used as a fertilizer.

The width of the *noise* area covered by the four-motored, propeller-driven airliner is about two miles from each side of the flight path.